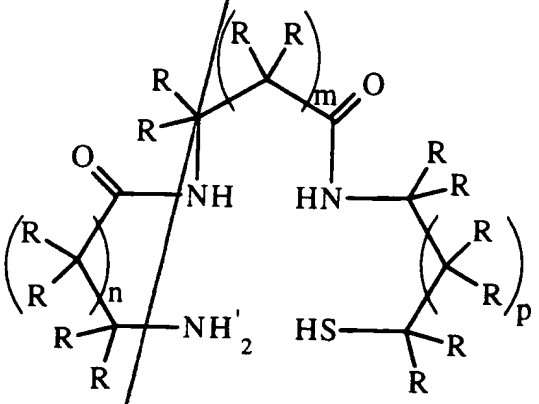
What is claimed is:

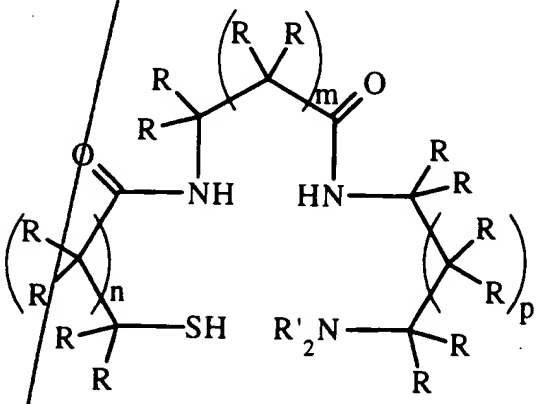
1. A reagent for preparing a radiopharmaceutical agent that is a monoamine, diamide, thiol-containing metal chelator covalently linked to a targeting moiety.

2. A ~~composition~~ reagent of Claim 1 wherein the metal chelator is selected form the group consisting of:

(i) a group having the formula:



and (ii) a group having the formula:



wherein:

n, m and p are each independently 0 or 1,

each R′ is independently H, lower alkyl, hydroxyalkyl (C_2-C_4), or alkoxyalkyl (C_2-C_4);

each R is independently H or R″, where R″ is substituted or unsubstituted lower alkyl or phenyl not comprising a thiol group;

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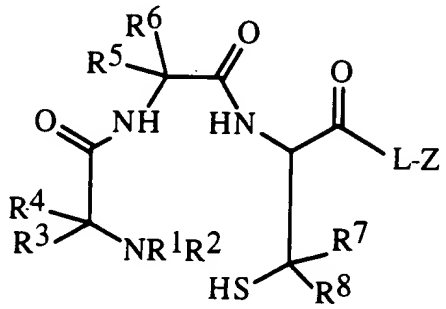
one R or R′ is L, wherein when an R′ is L, $-NR'_2$ is an amine; and

L is a bivalent linking group linking the chelator to the targeting moiety.

3. A composition of Claim 2 wherein the metal chelator has the formula:



wherein:

R^1 and R^2 are each independently H, lower alkyl, hydroxyalkyl (C_2-C_4) or alkoxyalkyl (C_2-C_4);

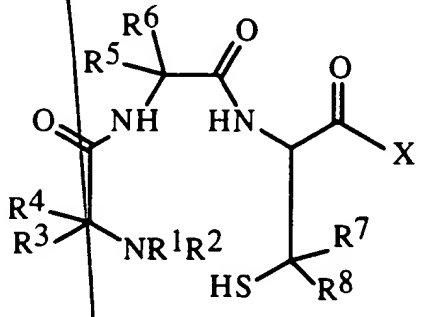
R^3, R^4, R^5, and R^6 are independently H, substituted or unsubstituted lower alkyl or phenyl not comprising a thiol group;

R^7 and R^8 are each independently H, lower alkyl, lower hydroxyalkyl or lower alkoxyalkyl;

L is a bivalent linking moiety; and

Z is a targeting moiety.

4. A composition of Claim 2 wherein the metal chelator has the formula:



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wherein:

R^1 and R^2 are each independently H, lower alkyl, hydroxyalkyl (C_2-C_4), or alkoxyalkyl (C_2-C_4);

R^3, R^4, R^5, and R^6 are independently H, substituted or unsubstituted lower alkyl or phenyl not comprising a thiol group, and one of R^3, R^4, R^5, and R^6 is Z-L-$(CR_2)_n$-, where n is an integer from 1 to 6 and each R is independently H, lower alkyl, or substituted lower alkyl;

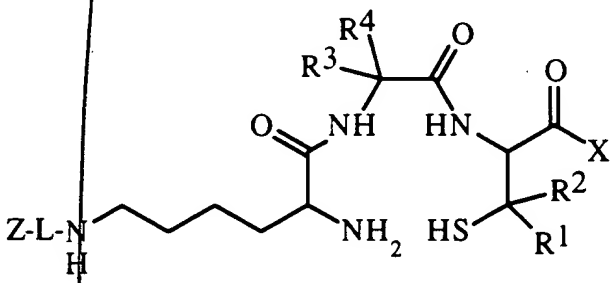
R^7 and R^8 are each independently H, lower alkyl, lower hydroxyalkyl or lower alkoxyalkyl;

L is a bivalent linking moiety;

Z is a targeting moiety; and

X is $-NH_2$, $-NR^1R^2$, or $-NR^1$-Y, where Y is an amino acid, an amino acid amide, or a peptide of from 2 to about 20 amino acids.

5. A composition of Claim 4 wherein the metal chelator has the formula:



wherein:

R^1 and R^2 are each independently H, lower alkyl, hydroxyalkyl (C_2-C_4) or alkoxyalkyl (C_2-C_4);

R^3, R^4, R^5, and R^6 are independently H, substituted or unsubstituted lower alkyl or phenyl not comprising a thiol group;

n is an integer from 1 to 6;

L is a bivalent linking moiety; and

Z is a targeting moiety.

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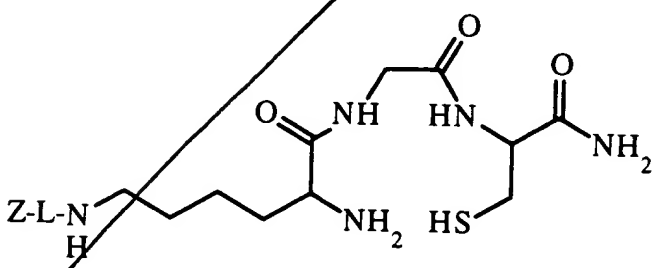
6. A composition of Claim 5 wherein the metal chelator has the formula:



wherein:

L is a linker group; and

Z is a targeting moiety

7. A composition of Claim 2 wherein the metal chelator is selected from the group consisting of:

(amino acid)^1-(amino acid)^2-cysteine-,

(amino acid)^1-(amino acid)^2-isocysteine-,

(amino acid)^1-(amino acid)^2-homocysteine-,

(amino acid)^1-(amino acid)^2-penicillamine-,

(amino acid)^1-(amino acid)^2-2-mercaptoethylamine-,

(amino acid)^1-(amino acid)^2-2-mercaptopropylamine-,

(amino acid)^1-(amino acid)^2-2-mercapto-2-methylpropylamine-,

(amino acid)^1-(amino acid)^2-3-mercaptopropylamine-,

wherein:

(amino acid) is a primary α- or β-amino acid not comprising a thiol, and wherein the chelating group is attached to a targeting moiety *via* a covalent bond with the carboxyl terminus of the chelating group or a side chain on one of the amino acid groups.

8. A composition of Claim 7 wherein (amino acid)^1 is either a α,ω- or β,ω-diamino acid wherein the α- or β-amine is a free amine.

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9. A composition of Claim 2 wherein the metal chelator is selected form the group consisting of:

-cysteine-(amino acid)-(α,ω- or β,ω-diamino acid);

-isocysteine-(amino acid)-(α,ω- or β,ω-diamino acid);

-homocysteine-(amino acid)-(α,ω- or β,ω-diamino acid);

-penicillamine-(amino acid)-(α,ω- or β,ω-diamino acid);

2-mercaptoacetic acid-(amino acid)-(α,ω- or β,ω-diamino acid);

2- or 3-mercaptopropionic acid-(amino acid)-(α,ω- or β,ω-diamino acid);

2-mercapto-2-methylpropionic acid-(amino acid)-(α,ω- or β,ω-diamino acid);

wherein:

(amino acid) is a primary α- or β-amino acid not comprising a thiol; and

wherein the chelating group is attached to a targeting moiety *via* a covalent bond with the amino terminus of the chelating group or a side chain of one of the amino acid groups comprising the chelating group.

10. A composition of Claim 2 wherein the chelating group has a formula selected from the group consisting of:

Gly-Gly-Cys-
Arg-Gly-Cys-
-(ϵ-Lys)-Gly-Cys-
-(δ-Orn)-Gly-Cys-
-(γ-Dab)-Gly-Cys-
and
-(β-Dap)-Gly-Cys-

11. A composition of Claim 2 wherein the linker, L, comprises an amino acid or a peptide comprising from 2 to about 20 amino acids.

12. A composition of Claim 1 wherein the targeting moiety is a specific binding peptide comprised of about 3 to about 45 amino acids.

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13. A composition of Claim 12 wherein the specific binding peptide binds to a somatostatin receptor.

14. A composition of Claim 12 wherein the specific binding peptide binds to a GPIIb/IIIa receptor.

15. A composition of Claim 12 selected from the group consisting of:

(DTPA).Nal_D.Cpa.YW_DKT.Nal.T(ϵ-K)GCKK.amide
F_D.Cpa.YW_DK.Abu.Nal.T(ϵ-K)GC.amide
CH_2CO.FFW_DKTFC(ϵ-K)GC.amide
cyclo(*N*-CH_3)FYW_DKV.Hcy.(CH_2CO.(ϵ-K)GC.amide)
GGCSIPPEVKFNKPFVYLIamide (SEQ. ID NO 1)
GGCSIPPEVKFNKPFVYLI (SEQ. ID NO 2)
GGCGLF (SEQ. ID NO 3)
RGCSIPPEVKFNKPFVYLIamide (SEQ. ID NO 4)
RGCQAPLYKKIIKKLLES (SEQ. ID NO 5)
RGCGHRPLDKKREEAPSLRPAPPPISGGYRamide (SEQ. ID NO 6)
GGCRPKPQQFFGLMamide (SEQ. ID NO. 7)
AKCGGGF$_D$YW_DKTFTamide (SEQ. ID NO 8)
GGCFVYLI.amide (SEQ. ID NO 9)
acetyl.F_DFYW_DKTFT(ϵ-K)GC.amide
(DTPA).F_DFYW_DKTFT(ϵ-K)GC.amide
acetyl.F_DFYW_DKTFTGGG(ϵ-K)GC.amide
(DTPA).(ϵ-K)GCF_DFYW_DKTFT.amide
acetyl.F_DFYW_DKTFTGGG(ϵ-K)KC.amide
F_D.Cpa.YW_DKTFTGGG(ϵ-K)GC.amide
(DTPA).F_D.Cpa.YW_DKTFT(ϵ-K)GC.amide
(DTPA).Nal_D.Cpa.YW_DKTFT(ϵ-K)GC.amide
(DTPA).Aca.F_D.Cpa.YW_DKTFT(ϵ-K)GC.amide
cyclo(*N*-CH_3)FYW_DKV.Hcy.(CH_2CO.K(ϵ-K)GC.amide)
(DTPA).Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
acetyl.KKKKK.Nal_D.Cpa.YW_DKTFT(ϵ-K)GC.amide
CH_2CO.FFW_DKTFCKKKKK(ϵ-K)GC.amide
CH_2CO.FFW_DKTFC(ϵ-K)KKKKKGC.amide
DDDD.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKKKK.amide
Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
(2-ketogulonyl).F_D.Cpa.YW_DKTFT(ϵ-K)GC.amide
KDKD.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKDKD.amide
acetyl.KKKKK.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
acetyl.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide

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KKKK.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCDDDD.amide
(2-ketogulonyl).Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
Trc.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
Hca.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
$(Trc)_2$.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
K_DKKK.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCDD.amide
K_DDKD.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKDKD.amide
cyclo(*N*-CH_3)FYW_DKV.Hcy.(CH_2CO.KKKKK(ϵ-K)GC.amide)
acetyl.KK(ϵ-K)GCGCGGPLYKKIIKKLLES
F_D.Cpa.YW_DKTFT(ϵ-K)GCR.amide
(Trc-imide).Nal_D.Cpa.YW_DKTFT(ϵ-K)GCR.amide
Trc.(Trc-imide).K.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCRR.amide
$(Trc\text{-imide})_2$K.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCR.amide
cyclo(*N*-CH_3)FYW_DKV.Hcy.(CH_2CO.(ϵ-K)GCK.amide)
(*acetyl*.TKPRGG)$_2$K(ϵ-K)GC.amide
acetyl-DDD.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
K_DKK.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCDDD.amide
D_DDF_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
acetyl.D_DDF_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
K_DKKKF_DK.Cpa.YW_DKTF,Nal.(ϵ-K)GCDDDD.amide
D_DF$_D$.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
acetyl.D_DF$_D$.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
F_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
F_DFYW_DKTFT(ϵ-K)GCKK.amide
(CH_2CO.Y_D.Apc.GDCGGC$_{Acm}$GC$_{Acm}$GGC.amide)$_2$(CH_2CO)$_2$K.(ϵ-K)GC.amide
(CH_2CO.Y_D.Apc.GDC)$_2$K.(ϵ-K)GCG.amide
K_D.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCD.amide
K_DK.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCDD.amide
{(CH_2CO.Y_D.Apc.GDCG)$_2$KG}$_2$.K(ϵ-K)GCG.amide
{(CH_2CO.Y_D.Apc.GDCGGCG.amide)(CH_2CO)}$_2$.K(ϵ-K)GC.amide
(CH_2CO.Y_D.Apc.GDCKKG)$_2$K(ϵ-K)GC.β-Ala.amide
({(CH_2CO.Y_D.Apc.GDCGGC$_{Acm}$GC$_{Acm}$GGC.amide)(CH_2CO)}$_2$.K)$_2$K(ϵ-K)GCG.amide
cyclo(*N*-CH_3)FYW_DKV.Hcy.(CH_2CO.K(ϵ-K)KCK.amide)
cyclo(*N*-methyl)FYW_DKV.Hcy.(CH_2CO.(β-Dap)KCR.amide)
cyclo(*N*-methyl)FYW_DKV.Hcy.(CH_2CO.(β-Dap)KCK.amide)
cyclo(*N*-methyl)FYW_DKV.Hcy.(CH_2CO.(δ-Orn)GCK.amide)
cyclo(*N*-methyl)FYW_DKV.Hcy.(CH_2CO.(β-Dap)GCK.amide)
cyclo(*N*-methyl)FYW_DKV.Hcy.(CH_2CO.(ϵ-K)GCKK.amide)
cyclo(*N*-CH_3)FYW_DKV.Hcy.(CH_2CO).K(ϵ-K)GC.amide
(DTPA).Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
~~AKCGGGF$_D$YW$_D$KTFT.amide~~
(DTPA).Nal_D.Cpa.YW_DKT.Nal.T(ϵ-K)GCKK.amide
cyclo(*N*-CH_3)FYW_DKV.Hcy.(CH_2CO).(ϵ-K)GC.amide

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KDKD.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKDKD.amide
(2-ketogulonyl)F_D.Cpa.YW_DKTFT(ϵ-K)GC.amide
acetyl.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
{(CH_2CO.Y_D.Apc.GDCGGC$_{Acm}$GC$_{Acm}$GGC.amide)$_2$(CH_2CO)$_2$K}$_2$.K(ϵ-K)GCG.amide
(CH_2CO.Y_D.Apc.GDCKGCG.amide)$_2$(CH_2CO)$_2$K(ϵ-K)GC.amide
(CH_2CO.Y_D.Apc.GDCKGG)$_2$K(ϵ-K)GC.β-Ala.amide
{(CH_2CO.Y_D.Apc.GDCG)$_2$KG}$_2$K(ϵ-K)GCG.amide
(CH_2CO.Y_D.Apc.GDCGGC$_{Acm}$GC$_{Acm}$GGC.amide)$_2$(CH_2CO)$_2$K(ϵ-K)GC.amide
cyclo(*N*-CH_3)FYW_DKV.Hcy.(CH_2CO).(ϵ-K)GCK.amide
cyclo(*N*-CH_3)FYW_DKV.Hcy.(CH_2CO.GC.Dap.Dap.amide)
cyclo(*N*-CH_3)FYW_DKV.Hcy.(CH_2CO.(β-Dap)KCR.amide)
cyclo(*N*-CH_3)FYW_DKV.Hcy.(CH_2CO.(β-Dap)KCK.amide)
cyclo(*N*-CH_3)FYW_DKV.Hcy.(CH_2CO.(γ-Dab)KCR.amide)
cyclo(*N*-CH_3)FYW_DKV.Hcy.(CH_2CO.(δ-Orn)GCK.amide)
cyclo(*N*-CH_3)FYW_DKV.Hcy.(CH_2CO.(β-Dap)GCK.amide)
acetyl-KKKKKK(ϵ-K)GCGGPLYKKIIKKLLES
(CH_2CO.Y_D.Amp.GDC.KGCG.amide)$_2$(CH_2CO)$_2$K(ϵ-K)GC.amide
and
(CH_2CO.Y_D.Amp.GDC.GGC$_{Acm}$GC$_{Acm}$GGC.amide)$_2$(CH_2CO)$_2$K(ϵ-K)GC.amide

16. A composition of Claim 13 selected from the group consisting of:

(DTPA).Nal_D.Cpa.YW_DKT.Nal.T(ϵ-K)GCKK.amide
F_D.Cpa.YW_DK.Abu.Nal.T(ϵ-K)GC.amide
CH_2CO.FFW_DKTFC(ϵ-K)GC.amide
cyclo(*N*-CH_3)FYW_DKV.Hcy.(CH_2CO.(ϵ-K)GC.amide)
AKCGGGF_DYW_DKTFTamide (SEQ ID NO 8)
acetyl.F_DFYW_DKTFT(ϵ-K)GC.amide
(DTPA).F_DFYW_DKTFT(ϵ-K)GC.amide
acetyl.F_DFYW_DKTFTGGG(ϵ-K)GC.amide
(DTPA).(ϵ-K)GCF_DFYW_DKTFT.amide
acetyl.F_DFYW_DKTFTGGG(ϵ-K)KC.amide
F_D.Cpa.YW_DKTFTGGG(ϵ-K)GC.amide
(DTPA).F_D.Cpa.YW_DKTFT(ϵ-K)GC.amide
(DTPA).Nal_D.Cpa.YW_DKTFT(ϵ-K)GC.amide
(DTPA).Aca.F_D.Cpa.YW_DKTFT(ϵ-K)GC.amide
~~*cyclo*(*N*-CH_3)FYW_DKV.Hcy.(CH_2CO.K(ϵ-K)GC.amide)~~
(DTPA).Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
acetyl.KKKKK.Nal_D.Cpa.YW_DKTFT(ϵ-K)GC.amide
CH_2CO.FFW_DKTFCKKKKK(ϵ-K)GC.amide
CH_2CO.FFW_DKTFC(ϵ-K)KKKKKGC.amide
DDDD.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKKKK.amide
Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
(2-ketogulonyl).F_D.Cpa.YW_DKTFT(ϵ-K)GC.amide

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KDKD.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKDKD.amide
acetyl.KKKKK.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
acetyl.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
KKKK.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCDDDD.amide
(2-ketogulonyl).Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
Trc.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
Hca.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
$(Trc)_2$.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
K_DKKK.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCDD.amide
K_DDKD.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKDKD.amide
cyclo(*N*-CH_3)FYW$_D$KV.Hcy.(CH_2CO.KKKKK(ϵ-K)GC.amide)
F_D.Cpa.YW_DKTFT(ϵ-K)GCR.amide
(Trc-imide).Nal_D.Cpa.YW_DKTFT(ϵ-K)GCR.amide
Trc.(Trc-imide).K.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCRR.amide
(Trc-imide)$_2$K.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCR.amide
cyclo(*N*-CH_3)FYW$_D$KV.Hcy.(CH_2CO.(ϵ-K)GCK.amide)
acetyl-DDD.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
K_DKK.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCDDD.amide
D_DDF_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
acetyl.D_DDF_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
K_DKKKF_DK.Cpa.YW_DKTF,Nal.(ϵ-K)GCDDDD.amide
D_DF_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
acetyl.D_DF_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
F_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
F_DFYW$_D$KTFT(ϵ-K)GCKK.amide
K_D.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCD.amide
K_DK.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCDD.amide
cyclo(*N*-CH_3)FYW$_D$KV.Hcy.(CH_2CO.K(ϵ-K)KCK.amide)
cyclo(*N*-methyl)FYW$_D$KV.Hcy.(CH_2CO.(β-Dap)KCR.amide)
cyclo(*N*-methyl)FYW$_D$KV.Hcy.(CH_2CO.(β-Dap)KCK.amide)
cyclo(*N*-methyl)FYW$_D$KV.Hcy.(CH_2CO.(δ-Orn)GCK.amide)
cyclo(*N*-methyl)FYW$_D$KV.Hcy.(CH_2CO.(β-Dap)GCK.amide)
cyclo(*N*-methyl)FYW$_D$KV.Hcy.(CH_2CO.(ϵ-K)GCKK.amide)
cyclo(*N*-CH_3)FYW$_D$KV.Hcy.(CH_2CO).K(ϵ-K)GC.amide
(DTPA).Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
AKCGGGF_DYW$_D$KTFT.amide
(DTPA).Nal_D.Cpa.YW_DKT.Nal.T(ϵ-K)GCKK.amide
cyclo(*N*-CH_3)FYW$_D$KV.Hcy.(CH_2CO).(ϵ-K)GC.amide
KDKD.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKDKD.amide
(2-ketogulonyl)F_D.Cpa.YW_DKTFT(ϵ-K)GC.amide
acetyl.Nal_D.Cpa.YW_DKTFT(ϵ-K)GCKK.amide
cyclo(*N*-CH_3)FYW$_D$KV.Hcy.(CH_2CO).(ϵ-K)GCK.amide
cyclo(*N*-CH_3)FYW$_D$KV.Hcy.(CH_2CO.GC.Dap.Dap.amide)

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cyclo(*N*-CH_3)FYW$_D$KV.Hcy.(CH_2CO.(β-Dap)KCR.amide)
cyclo(*N*-CH_3)FYW$_D$KV.Hcy.(CH_2CO.(β-Dap)KCK.amide)
cyclo(*N*-CH_3)FYW$_D$KV.Hcy.(CH_2CO.(γ-Dab)KCR.amide)
cyclo(*N*-CH_3)FYW$_D$KV.Hcy.(CH_2CO.(δ-Orn)GCK.amide)
and
cyclo(*N*-CH_3)FYW$_D$KV.Hcy.(CH_2CO.(β-Dap)GCK.amide)

17. A composition of Claim 14 selected from the group consisting of:

{(CH_2CO.Y$_D$.Apc.GDCGGC$_{Acm}$GC$_{Acm}$GGC.amide)$_2$(CH_2CO)$_2$K}$_2$.K(ε-K)GCG.amide
(CH_2CO.Y$_D$.Apc.GDCKGCG.amide)$_2$(CH_2CO)$_2$K(ε-K)GC.amide
(CH_2CO.Y$_D$.Apc.GDCKGG)$_2$K(ε-K)GC.β-Ala.amide
{(CH_2CO.Y$_D$.Apc.GDCG)$_2$KG}$_2$K(ε-K)GCG.amide
(CH_2CO.Y$_D$.Apc.GDCGGC$_{Acm}$GC$_{Acm}$GGC.amide)$_2$(CH_2CO)$_2$K(ε-K)GC.amide
(CH_2CO.Y$_D$.Amp.GDC.KGCG.amide)$_2$(CH_2CO)$_2$K(ε-K)GC.amide
and
(CH_2CO.Y$_D$.Amp.GDC.GGC$_{Acm}$GC$_{Acm}$GGC.amide)$_2$(CH_2CO)$_2$K(ε-K)GC.amide.

18. A scintigraphic imaging agent for imaging sites within a mammalian body that is a composition of matter of Claim 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 16, or 17 radiolabeled with a radioisotope selected from the group consisting of technetium-99m and copper-64.

19. A method for preparing a scintigraphic imaging agent for imaging sites within a mammalian body comprising reacting a reagent of Claim 1 with technetium-99m in the presence of a reducing agent.

20. The method of Claim 19 wherein the reducing agent is a stannous ion.

21. A method for preparing a scintigraphic imaging agent for imaging sites within a mammalian body comprising reacting a reagent of Claim 1 with Tc-99m wherein the Tc-99m is in a reduced form.

22. A method for preparing a reagent of Claim 1 wherein the reagent is synthesized by solid phase peptide synthesis.

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23. A kit for preparing a radiopharmaceutical preparation, said kit comprising sealed vial containing a predetermined quantity of a reagent according to Claim 1 and a sufficient amount of reducing agent to label said reagent with Tc-99m.

24. A method for imaging a target site within a mammalian body comprising administering an effective diagnostic amount of the scintigraphic imaging agent of Claim 18 wherein the scintigraphic imaging agent accumulates at the target site, and the localized radioisotope is detected.

25. A radiotherapeutic agent comprising a reagent of Claim 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 16, or 17 radiolabeled with a radionuclide selected from the group consisting of Re-186, Re-188, Sn-117m, and Cu-67.

26. A composition of matter comprising a monoamine, diamide, thiol-containing metal chelator.

27. A composition of matter according to Claim 26 wherein the metal chelator is complexed with a metal selected from the group consisting of rhenium-186, rhenium-188, copper-67 and tin-117m.

28. A composition of matter according to Claim 26 wherein the metal chelator is complexed with a metal selected from the group consisting of technetium-99m and copper-64.

29. A radiopharmaceutical agent comprising the composition of matter of Claim 27.

30. A radiopharmaceutical agent comprising the composition of matter of Claim 28.

31. A composition of matter comprising, in combination, a monoamine, diamide, thiol-containing metal chelator covalently linked to a targeting moiety.

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32. A composition of matter according to Claim 31 wherein the metal chelator is complexed with a metal selected from the group consisting of rhenium, zinc, copper and tin.

33. A composition of matter according to Claim 31 wherein the metal chelator is complexed with a metal selected from the group consisting of rhenium-186, rhenium-188, copper-67 and tin-117m.

34. A composition of matter according to Claim 31 wherein the metal chelator is complexed with a metal selected from the group consisting of technetium-99m and copper-64.

35. A radiopharmaceutical agent comprising the composition of matter of Claim 33.

36. A radiopharmaceutical agent comprising the composition of matter of Claim 34.

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